Karen Sullivan conversation with Suzanne McDermott, PhD, University of South Carolina
11:45 a.m. MST 01/09/2020

SULLIVAN, KAREN | MCDERMOTT, SUZANNE 12/11/20

Brain cancer study questions

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Dr. McDermott:

You and I met briefly in Butte in October 2018 at Montana Tech; also meeting with us I believe were Montana's lead epidemiologist Laura Williamson, the state's cancer epidemiologist Heather Zimmerman, and a state toxicologist, Matt Ferguson. This meeting occurred shortly before your talk on your cancer study released last year. It was a pleasure meeting you at that time; I came away from that meeting feeling that our missions are the same, to leverage data-driven approaches to protect public health. That mission is very important to me in Butte-Silver Bow.

In the midst of the recent release of your meconium study, I am hearing that release and publication of your brain cancer study in Butte and Anaconda is imminent. In the wake of that release, I am wondering if you can relay to me what this study's major findings are. Are there conclusions that can be drawn from this study? I guess just as importantly, are there conclusions that cannot be drawn? I am also wondering if your study was able to attribute reasons for your findings? Also, Dr. McDermott, in your opinion, what additional research needs to be completed in this area?

I ask these questions in the interest of determining what public health actions might be taken, based on the findings of your brain cancer study. Do you yourself have suggestions on public health actions that might be executed, based on your findings?

I would very much appreciate a reply from you on the questions that I have. In fact, I would sincerely appreciate a phone conversation if you have time. Would you let me know if that is possible?

Thanks so much, I appreciate your time – Karen Sullivan

Karen Sullivan, M.A., Health Officer
The City-County of Butte-Silver Bow
Health Department
25 W. Front St.
Butte, MT 59701
Telephone : 406.497.5003
ksullivan@bsb.mt.gov

MCDERMOTT, SUZANNE <SMCDERMO@mailbox.sc.edu> Sullivan, Karen

Re: Brain cancer study questions

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Action Items Suggested Meetings

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Der Karen,
Happy New Year!
I would like to arrange a time for a phone call with you since the article about Brain Cancer will be out shortly. Please let me know some times that are open for you this week.
Thanks
Suzanne

—

Suzanne McDermott, Ph.D.
Professor

803-777-7225
smcdermo@mailbox.sc.edu

Department of Epidemiology and Biostatistics
Arnold School of Public Health
University of South Carolina
Discovery Building, 915 Greene Street
Columbia , SC 29208

Arnold School of Public Health

Dr. McDermott and I began our conversation by her detailing for me her recommendation on her study's call to public health action, related to her recently published study titled "High incidence of brain and other nervous system cancer identified in two mining counties, 2001-2015." Dr. McDermott said that after years of historic mining and current active mining, the community has focused surveillance on lead, arsenic and mercury. "That is the wrong target," she said. "Copper is the actual metal being mined." She said that surveillance also needs to include involvement of copper, manganese and zinc. She referred to these as neurotoxic metals associated with poor health outcomes. She also said she recommends tightening of surveillance – she referenced the short half-life or inorganic arsenic, and called analysis of urine and blood inadequate. "Hair is a good indicator." She said surveillance needs to include residence mapping of the study's children 0-5 and adults 30-34 is important, and also a query of where these populations have lived previously. Are these populations clustered, or do they reside in a wider geographic area?

Since the mission of those in public health is to improve the lives of people, Dr. McDermott recommended surveilling "everybody" and that some agreement with EPA and ATSDR should be pursued, since funding would be required. Dr. McDermott referred to herself as an epidemiologist versus a chemist and said her guide is Aschner's "Neurotoxicity of Metals" [HYPERLINK "https://www.google.com/books/edition/Neurotoxicity_of_Metals/jc40DwAAQBAJ?hl=en&gbpv=1&printsec=frontcover"]. She said if further surveillance is carried out, that a specific academic lab should be selected, versus a hospital or commercial lab. She said her USC

colleague, Jamie Lead, PhD, is a "world-known nanochemist" whose lab technology can find particles at low levels that are otherwise non-detectable. She said that Dr. Lead's findings report as "actual levels that he can measure while others can't." She referenced machines being set at "poison" level or below poison level and that some labs will develop no answers on their queries because their technology can't detect at these lower but important levels. She mentioned Dr. Hailer using the University of Montana lab for the meconium study and (I hope I have this right from my notes) was able to lower detection limits. Dr. McDermott talked about the obvious combining of Butte-Silver Bow and Anaconda-Deer Lodge for this study for the larger sample size. She said she could not, for her most recent study, parse out from the Montana Tumor Registry where people reside or where they've resided in the past. In regard to the study's call for the additional research needed to explore associations between metal exposures and brain and other nervous system cancers, she recommended querying about residence and residential history, but also about radiation exposure, family history and other known risk factors. But the universal question remains: Why do some people get brain cancer and others don't. She said genes can protect from risk or accentuate risk, and some humans are simply more vulnerable than others. She said she and the wider research community need to begin to understand the epigenetics and genetics involved in these questions. "It will take years to uncover," she said. She mentioned more research into methylation and epigenetic mechanisms (sorry, she lost me a bit here). "This is not a simple thing," she said. "This is not black and white." She said research such as hers will always have its doubters. She wanted very much for her most recent study to have no findings, but she called the ultimate findings "disturbing." She is positing that young children and adults in Butte-Silver Bow and Anaconda-Deer Lodge have "higher risks" than anyplace else in Montana, and she said the prospective risk associated with metals exposures is "very frightening to me." She said public health action needs to begin with determining exposure pathways.